Developing caBIG® Training- Training Approaches & Testing

Developing caBIG ® Training: Training Approaches & Testing

Prepared by the caBIG ® Documentation and Training Workspace

Overview

- This is a hands-on working guide for anyone developing training modules for caBIG™.
- It describes alternative training approaches/ formats for the caBIG™program, and the benefits and weaknesses of each.
- It also helps determine if testing should accompany the training program, and the different types of testing that can be done.

Objectives

By the end of this guide, you will be able to:

List five different delivery formats for training, and some benefits and weaknesses of each.

Describe when testing procedures should accompany caBIG™training and different types of testing methods available.

Access additional resources to assist in training development.

Sections in this Guide
1.Training Delivery Alternatives
2.Testing Strategies
3.Review & Resources

Training Delivery Alternatives
•There are fivealternatives for training delivery that can be used for caBIG™:
-Instructor Led -Classroom
-Instructor Led -Virtual Environment
-Self-Directed Training
-Mentoring
-Blended Approaches

Instructor Led -Classroom
•This training approach assembles all learners in the same physical space to experience the same event.
•Can be conducted in a traditional classroom, a demo room or laboratory, or at a conference.

Instructor Led -Classroom

BENEFITS•High impact, real-time, meaningful group interaction and feedback•Minimizes external distractions•Maximizes the chance to create a sustained community once training is over•Effective way to convey complex material•Maintains the most control over the process, participation, and the level of engagement •Good for small co-located groups that can be brought together easily.•Good when content is still changing.

WEAKNESSES•Learners must flex to the schedule and place of the event. •Class size limited by available space. •Successful events depend upon the trainer's expertise -both in content and delivery. •Excludes learners who can not~~ for cost or timing reasons~~ be there.•Can be costly to host, deliver and attend (especially with added costs of trainer or learner travel).Overview | Training Delivery Alternatives| Testing Strategies | Review & Resources

Instructor Led -Virtual Environment
•This approach assembles learners together at the same time in a virtual environment to experience the same materials and have equal access to the instructor.
•Includes e-classroom events (e.g. Centra, Net Meeting) and video-conferencing.

Instructor Led -Virtual EnvironmentBENEFITS•Interaction of group members in the moment allows for better connection with discussions.•Allows real-time connection, feedback, and engagement across time zones without the cost or scheduling of travel.•Offers opportunity for engaged learning community once training is over -particularly if a face-to-face is followed by online sessions•Maintains control over process, and some degree of participation•If recorded, this format can be available online after the event. WEAKNESSES•Demands that learners flex to the schedule and technology of event. •Heavy burden on the trainer, who must maintain online materials and manage virtual interaction -many find virtual environment harder to manage than face-to-face class. •Successful events depend upon the expertise of the trainer -both in content and facilitation. •Technological difficulties can interrupt event and may eliminate some participants. •Learners who are alone may find themselves "multi-tasking"during training, missing key points.

Self-Directed Training
•This approach provides printed and/or electronic materials for learners to engage with at their own pace.
•Includes web-based or computer-based training, PowerPoint presentations, Wiki's, and a variety of job aids including checklists, manuals, help guides, workbooks, and Quick Guides.

Examples of Self-Directed Training
•Computer Based Training (CBT) -Training that is computer-based, often delivered via a CD or downloadable file. Key: Once transferred to the user, the author no longer has control over updating/correcting content.
•Web-Based Training (WBT)-A specific form of CBT that is delivered over the Internet and stored on a server controlled by training author. Key: Centralized content delivery means that the content can be updated and maintained by the author.
•Wiki-A internet-based collaborative authoring tool that allows user to easily add, remove and otherwise edit and change some available content.
•Workbooks/Guides -Documents (often generated using PowerPoint or Word processor) that present training content or guidance. These are sometimes considered to be job aids, rather than formal trainingtools.
•Other Job Aids-Checklists, Quick Guides and other project documentation can support and supplement training modules.

Self-Directed TrainingBENEFITS•Allows learner to work at own schedule and pace.•Allows for independent action and engagement by the learner, and are empowering and flexible tools.•Tends to be focused and highly actionable -providing learners with "just in time"information. •With the exception of web-based training, these options tend to be rather inexpensive and can reach many people.•While maintenance and upgrades may be required, once developed, these require little labor by trainer. WEAKNESSES•Unless accompanied by a traceable testing program, the worth and true usefulness of these options are generally unknown. •Control over the content of these materials can be maintained, but control over how they are actually used in the world is relinquished.•Do not build the community that interactive training techniques may foster.
•Inappropriate for highly complex material that must be tailored to meet individual learner needs. •With the exception of web-based training, inappropriate when content is still rapidly changing. Overview | Training Delivery Alternatives| Testing Strategies | Review & Resources

Mentoring
•Mentoring is a very special case of training and knowledge transfer. It involves matching someone with expertise in a specific subject area with someone needing that expertise.
•Mentoring requires intensive one-on-one investment, and only benefits a small learner group. To be utilized as a formal caBIG™training approach, the sponsor should consider why mentoring is the preferred approach, and must have a mentoring plan for achieving its goals.

MentoringBENEFITS•Allows experts to provide personalized and structured support to those new to the content•Mentoring is exercised in real time, so interventions can focus on practical application, rather than more abstract or general content and feedback is immediate•Good when information is highly complex or variable based on specific user needs•Given intensity of relationship, each learner likely to become accountable for his/her own learningWEAKNESSES•Inefficient, for only one recipient is the focal point---topics must be repeated with each new learner.
•Insights frequently not carried from one learner to another or within/across groups•The learning is decentralized so the lessons are only as good as the mentors delivering the content•Decentralization of the teaching means that the content may vary significantly across relationships•Requires both members of the relationship to be able and willing to commit the time to maintaining it. •Requires careful scoping to ensure that limits and focus are clearly understood

Blended Approaches
•Training programs can blend training methods:
-Classroom trainings followed by virtual sessions
-Training materials from classroom or virtual training converted and published as self-directed modules
-Mentoring follows an instructor led session
•Training methods may also differ based on maturity of the tool or product -see next slide for examples of how training may differ across releases.

Training May Differ As Tool Matures •At this point, both product and training content are likely to be fluid -so "real time"training is appropriate. •If test/beta group co-located, then Instructor Led Classroomtraining best. •If participants distributed at different locations, then Instructor Led Virtual Environmentappropriate.•Accompanying training with Mentoringcan help identify bugs or needed improvements -aiding both user and development team. Pilot or Beta Test Release:Small Test GroupInitial Release: Limited Adopter GroupBroad Release: Distributed User Base•Same methods for Pilot-Beta Test Group are appropriate if content is still evolving; and the initial user base is small enough to make classroom or virtual sessions practical. •As material matures or if user base is large, translating training support materials to Self-Directed Trainingformats becomes appropriate. •Pilot/Beta test users may serve as effective mentorsfor new Adopters. •As user base becomes larger and more distributed; and adoption happens over time, Self-Directed Training and supplemental job aids (e.g., reference documentation) may become the best alternatives. •PeriodicInstructor Led Virtual Environmenttraining sessions may be best for new users, advanced users, and/or for building community of practice. Overview | Training Delivery Alternatives| Testing Strategies | Review & Resources

Training Alternative Summary
Instructor-led Classroom
Best for small (<50), local learner community that can be scheduled together; and/or when material requires discussion or group interaction to learn effectively, and/or content is not yet stable.
Instructor-led -Virtual Environment
Best for distributed learners that can be scheduled together, and who have the technology required. Good when material is complex or not yet stable; and interaction will help clarify questions and build community.
Self-Directed Training
Best for large distributed audiences with different timing needs for training. Published training materials need to be stable given potential broad and uncontrolled distribution.
Mentoring
Best when experiential learning is needed for specialized tasks, for advanced application, or where apprenticing is needed to learn specific nuances. Low teacher : learner ratio.
Blended Approaches
Different formats may pick up different groups. May appeal to different learning styles and may increase exposure to a broader population.

Testing: An Overview
•Training is sometimes accompanied by some form of

testing, to assess whether learners can demonstrate
abilities and skills related to content being taught.
•Testing may include:
-Qualification Test-Often conducted post-training, this evaluation test measures learner against a benchmark performance level; skills must be demonstrated to allow some future action (e.g., tool access).
-Pre-Test/Test-Out-Evaluates learner's abilities priorto training; if scores are high enough, may skip some/all training modules.
-Self-Check Test-Allows learner to self-check learning as training unfolds.

Qualification Testing
•The most rigorous form of testing is qualification testingwhich requires that learners pass a test to do something. For caBIG™, qualification level training is needed for:
-Anything that has the potential to disrupt the data/work of others or otherwise interfere with Grid operations.
-Anything that involves the exposure of data/information that is under regulatory control.
•Additional guidance on qualification testing is under development by the D&T workspace (Fall 2006)

Pre-Test/Test-Out Options
•Pre-Test and Test-Out options achieve two key benefits:
-Pre-Tests allow you to measure the effectiveness of the training, by comparing knowledge/skills beforethe training against knowledge/skills afterthe training, as measured by qualification testing.
-Test-Out options allow you to pre-screen learners that already know the training content. This allows them to "skip"related training modules, and may save on trainer review.
•Pre-Tests or Test-Outs should contain identical content as a post-training qualification test.

Self-Check Tests
•Self-Check tests allow learner to assess individual progress through the training by answering test questions or completing hands-on exercises on their own.
•In this case, the overall test score is not important -but feedback to the learner about success on individual questions is critical to either confirm or correct learning.
•Where possible, these should be interspersed throughout the training to allow the learner "real time"engagement and feedback with the material.

If You Decide to Test....
•Methodological considerations if you are developing testing to accompany your training:
-How will test be delivered? Examples: Classroom written test, hands-on performance test (demonstrating specific skills), on-line test, open book outside class.
-How will feedback be provided? Will a CBT or WBT authoring toolbe used to automate responses to learner action, will there be a separate testing mechanism (e.g., via a Learning Management System testing module), or will some other feedback mechanism be used? If so, what is that mechanism, and how will it be developed and administered?
-How and who will score tests (related to feedback question above)? Do not deploy testing without having a plan and infrastructure for managing the feedback and reporting process.
-What is the refresher testing policy? For qualification testing, determine if the test must be repeated periodically to confirm retention of skills over time.

Types of Testing Activities
Here are three examples of test activities/formats, with key advantages and disadvantages -all can be modified to deliver through either an on-line or classroom environment, some more easily than others.
Method
Advantages
Disadvantages
Skills Demonstration-Learner demonstrates skill for instructor
Clearly demonstrates ability to perform required activity.
Case Study/Scenario/Exercise-Learner(s) complete(s) exercise or creates scenario and provides output to instructor for feedback
Demonstrates ability to generate required output or use new knowledge to create a use case scenario; can be done remotely or in groups.
May verify correctness of output, but not the process for generating it. Case study evaluations may be subjective.
Easier to administer than a demonstration. Can be delivered in classroom, virtual or online setting.
Time consuming depending on what is being tested; Labor intensive to check performance.
Standard Objective Test-Learner answers mix of written question types (multiple choice, matching, fill in blank, etc)
Takes time to construct and pilot the test itself. May or may not capture actual skills needed for application.

Example: Case Study/Scenario/Exercise Test
•The "Informatics Team"is about to deploy its first release of caGWIZ. The team knows that there are four institutions in three time zones who will adopt the tool, but others have expressed interest as well. The product is ready to release, but the team also plans to make significant upgrades and improvements over the next year.
How should the "Informatics Team"go about training new users on the caWIZtool, now and in the future?
Justify your response.

Example: Standard Objective Test
•Multiple Choice.caGWIZVersion 2.0 is a highly stable product that is considered to be low on the "complexity of use"scale. It is available to a large population and downloaded regularly from the caBIG website. What form is training is likely to be best? (1) Mentoring; (2) Classroom training; (3) Self-Directed Training; (4) No training is needed.
•Fill in the Blank.List three advantages of "Instructor Led -Virtual Environment"training: (1) ______ (2) _____ (3) ______ .

•Matching.Match the testing method on the left with the description on the right:
1. Self-CheckA. May allow learner to skip selected training modules
2. QualificationB. Test results not recorded; for learner use only
3. Pre-Test/Test-OutC. An adequate score required to perform a specific task

Testing: Closing Points
•Testing helps confirm that learning has occurred, and therefore helps point to the effectiveness of training.
•Developing tests, however, is an intensive process -and if delivered on-line, can require technological investment to create and deploy.
•Generating feedback about performance is an essential element of test construction and delivery, regardless of format.

Review: Use Cases for Training
Alternatives & Test Options
No Test
Self-Check Testing
Qualification Testing
Instructor Led -Classroom
Informal classroom or lab training to introduce single team to a tool/application. This may be appropriate for a pilot tool that is not yet at its first broad release, or for a complex tool or concept.
Hands-on exercises or case studies to confirm understanding of material/tool use.
Laboratory training and testing where skills'testing is mandatory to allow access to tool. "Test Out"option to allow people to be qualified without attending training.
Instructor Led -Virtual
Same as with physical classroom -good for regularly scheduled concurrent sessions with distributed learner group
Same as with physical classroom -"drills"at personal workstations can be built into the program
Testing conducted post session to ensure skills/competence prior to gaining access to the tool
Mentoring
Mentoring program to support tool developers or those new to caBIG™workspaces. May be appropriate during beta/pilot test, or for a complex tool.
"See one -do one"structured mentoring, where learner is taught a skill and then practices independently.
Mentoring done to prepare learner for a formal test or qualification demonstration.
Self-Directed Study
Powerpointslide show distributed to user groups. Job aid (Wiki, Website, Help Guide) with no testing.
CBT, WBT, or workbooks with interactive Q&A or case studies, with access to answers/support, or CBT/WBT with testing module
Modular CBT/WBT with directed modules based on pre-test/post-test results. Appropriate for mature tools with broad, distributed user base added over time

Training Development Resources
•See our accompanying guide "Developing caBIG™Training Modules: A How-To-Guide"-available on the caBIG™Training Portal - https://cabig.nci.nih.gov/training
•Powerpointtraining templates are available on Training Portal to support Instructor Led (Classroom or Virtual) Training or Self-Directed Training with no testing.
•The Training Portal also includes guidelines for registering your project, requesting a Training mentor, and submitting your training modules for approval by the Documentation & Training WS.
•Once your training materials are completed and approved, they will be posted in the caBIG™Learning Management System at http://ncicbtraining.nci.nih.gov-the D&T Workspace and LMS team will work with you to facilitate this process.

Other References & Resources
•caBIG™Training Portal
https://cabig.nci.nih.gov/training/
•Documentation & Training GforgeCollaboration Site:http://gforge.nci.nih.gov/projects/cabig-tws/
•Documentation & Training Mentors -Request through NCICB E-Mail: ncicb@pop.nci.nih.gov
•caBIG™Documentation & Training Workspace https://cabig.nci.nih.gov/working_groups/Training_SLWG
•Documentation and Training Questions Listserv https://list.nih.gov/archives/cabig_bc_train-l.html\\

Review.....
•The guide is complete! Can you:
-List five different delivery formats for training, and some benefits and weaknesses of each?
-Describe when testing procedures should accompany caBIG™training and the different types of testing methods available?
-Access additional resources to assist in training development?